REMARKS

Reconsideration of the application is requested.

Claims 1-9 remain in the application. Claims 1-9 are subject to examination.

In item 3 on pages 2-4 of the above-identified Office Action, claims 1-9 have been rejected as being obvious over Japanese Patent JP 11-060390 to Kito (hereinafter Kito) under 35 U.S.C. § 103.

As will be explained below, it is believed that the claims were patentable over the cited art in their original form and, therefore, the claims have not been amended to overcome the references.

In Kito, a silicon carbine source powder is heated to a temperature of between 2200 and 2300° C for the production of a single crystal in a growing apparatus having a silicon carbide powder storage area. Prior to beginning the actual crystal growth (with a constant growth rate), a pressure P is increased to a quantity that is much larger than a growth pressure, whereby, when a sublimation temperature T is reached at the point in time t_2, a pressure P of approximately 500 Torr is provided. Due to the high pressure, a

considerable material transport and thus crystal growth is not possible. To allow the commencement of the growth phase, the pressure is reduced in discrete steps such that an e-curve is obtained to the point in time t_5. When the lower pressure is reached, the pressure and the temperature are kept constant during the entire sublimation time. In doing so, a controlled growth of the crystal is achieved during the growth phase.

In contrast, the invention of the instant application allows a small amount of growth during the startup phase that is not possible in Kito. In the invention, an apparatus for growing a single crystal with a silicone powder storage area and a seed crystal, is provided. The temperature is slowly and continuously increased to a sublimation temperature and a pressure P1 (a growth pressure) is established long before reaching the sublimation temperature T (growth temperature). The apparatus, when the growth pressure is established, is heated to the corresponding sublimation value. Claim 1 of the instant application recites:

> initially evacuating the crucible, and then filling the crucible with an inert gas, until a growth pressure is reached in the crucible, during the starting phase; and
>
> during the starting phase, initially heating the crucible to an intermediate temperature and then, in a heat-up phase, starting from the intermediate

temperature, heating the crucible to a growth temperature at a heating rate of at most 20° C/min.

The method according to the instant application is therefore based on an entirely different procedure than that of Kito. In the instant application, due to the slow increase of the temperature to a higher value, a slow transport rate is initially predetermined during the germination of the seed crystal. During the start-up phase, and particularly during the heating phase, a minimum concentration necessary for starting crystal growth on the SiC seed crystal can thus be realized at SiC gas phase components. In doing so, an uncontrolled evaporation of particularly silicon from the SiC seed crystal is prevented on the one hand, and, on the other hand, a growth of crystalline material on the SiC see crystal with a high growth rate is suppressed. The small oversaturation only effects a low germination on the SiC seed crystal. With this measure, the desired germination begins during the heating phase, and is additionally supported in the vicinity of the thermo-dynamic equilibrium.

The invention is based on the discovery that, in the method according to the prior art (i.e. Kito), the SiC gas phase at the SiC seed crystal is not in thermodynamic equilibrium with the SiC seed crystal in particular during the reduction in pressure to the growth pressure. Consequently, uncontrolled

accumulation of SiC gas-phase components at a crystallization surface of the SiC seed crystal occurs during the reduction in pressure. This has an adverse effect on the seeding of the growing of the SiC single crystal on the SiC seed crystal during the beginning of the growth process.

In contrast, and according to the invention, seeding of the SiC gas-phase components on a crystallization surface of the SiC seed crystal can be considerably improved by the heating-up of the crucible, the SiC seed crystal and the SiC stock to the growth temperature being carried out at the growth pressure which is subsequently also used during the growth phase. This eliminates a reduction in pressure, which is customary in the prior art (i.e. Kito), after the growth temperature has been reached and also the uncontrolled growth of the SiC gas-phase components on the crystallization surface of the SiC seed crystal that is caused by the drop in pressure. This is because slight and controlled seeding of the SiC gas-phase components on the crystallization surface of the SiC seed crystal takes place even during the heat-up phase (in the invention of the instant application), on account of slow heating-up at a heat-up rate of at most 20° C/min, and on account of the growth pressure in the crucible already being established during the heat-up phase.

In summary, Kito teaches a high pressure during the start up phase. Due to the high pressure, no appreciable crystal growth is possible. In contrast, the instant application teaches a growth pressure during the startup phase so that a slow growth is initiated in the startup phase. Furthermore, the teachings of Kito teach against the teachings of the instant application because no growth is allowed during the startup phase in Kito.

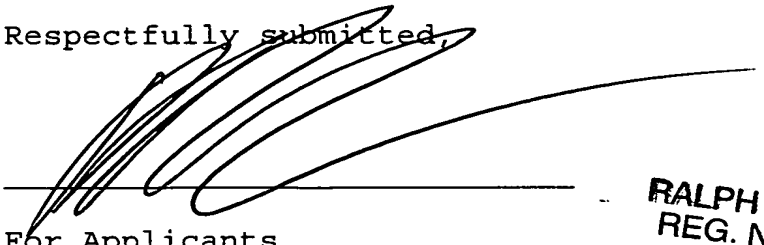
It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of claim 1. Claim 1 is, therefore, believed to be patentable over the art. The dependent claims are believed to be patentable as well because they all are ultimately dependent on claim 1.

In view of the foregoing, reconsideration and allowance of claims 1-9 are solicited.

Please charge any other fees that might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner

and Greenberg, P.A., No. 12-1099.

Respectfully submitted,



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